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Conceptual instrumentation of washing machine for conformity to the Islamic laws of Syarak

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ABSTRACT

The concept of today's washing machine that uses control technology to clean clothing is based on clothing weight factor proportionately to the amount of water used irrespective of the nature of the contaminants. However according to Islamic law, clothing such as being contaminated with children's urine for an example has to be cleaned using continuous flowing water especially during the initial stage of washing. With the concept of algorithm system and integrated into the washing machine, the continuous running water will be subjected during the initial wash and spin option. The light sensors used on both inlet and outlet valve will ensure the contaminated solids or liquids will be accordingly removed. Application of solenoid valve is used to control the water tank level during washing and drying period. Similar concept has been developed at Farm Unit, Department of Agriculture Science, UniSZA for removing the toxin from food tuber of *Dioscorea hispida* before it can consume securely. The analysis shows that using flowing new

water will remove toxicity which was represent of excrement in clothing. This paper elaborates the concept of automatic washing machine operation which complies with Islamic law of syarak.

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1. Introduction

Agriculture is the backbone of human civilization. It evolved with human history whereas in AL-Quran there are verses of agriculture significance invariably in many societies agriculture integrates into various socio-religious practices. Refer to Imam Nawawi in Kitab Sahih, the best work or effort for the human being is agriculture. In Malaysia, agriculture was, and is always an important government agenda to ensure the country's food security for all the people (Mohd *et al.*, 2010). This study was based on the current development of stand alone machine for removal of dioscorin for *Dioscorea hispida* or Malaysian name called ubi gadong. Unsuccessful on removing of dioscorine content in *Dioscorea hispida* may affect unhealthy condition for consumer while if the cloth especially for Muslim praying that contaminated by excrement which not accurately clean may disobey the commandment of muslim law.

The study on *Dioscoreae hispida* (*D.hispida*) is done on several applications on both chemical and tuber itself. (Agbo and Treche, 1995; Salam, 1990; Nashriyah *et al.*, 2010; Tattiyakul and Naksriarporn, 2010). *Dioscoreae hispida* (*D.hispida*) which entitle Ubi Gadong in Malaysia is a poisonous plant where methodical studies have shown that its rhizome or tuber contains toxic poison. It can only be consumed as a food after the poison of dioscorin is removed. Traditionally, it takes for up to 7 day of soaking *D.hispida* tubers in flowing water for detoxified process before it safe for human consumption (Udensi *et al.*, 2008; Hudzari *et al.*, 2011a).

2. Materials and methods

Figure 1 show the equipment we developed to enhance traditionally detoxified method is based on spin types of water circulation operation. This equipment used air lift submersible pump (Multi system pond pump) to produce water circulation. This pump produce 230 watt of power, 7.0 meter of maximum high and 16000 L/ hr of flow rate.

Inside the transparent container, an input pipe was placed at the bottom to produce spin type of water circulation. The air flow from this pump can make movement of slices tuber of *D.hispida* circulates around the system. The tubers are washed by using replacement of water to remove the dioscorine alkaloid. The vortex water circulation moved the sliced tubers up and down.

3. Results and discussion

Similarly the continuous running water will be subjected by opening outlet valve (S2) for contaminated water flowing out. Application of solenoid valve is used to control the water tank level during washing and drying period. It means that the inlet valve (S1) is still open when S2 is open for ensuring the water level in tank is in washing condition. It is done by water level measuring via sensor of ultra sonic (US). Light Intensity sensor (LI) is used to measure the water contaminated in value of 100 to 0 at move from darkness respectively. Microcontroller reacts as the 'mind' for controlling all operation in this process algorithm through distributes electrical signals of the solenoid valves and sensors. Figure 2 shows the graphical user interface software that used for programming this developed automatic machine. The programmed was embedded on Microcontroller as shown in figure 1 on making this machine work as stand alone stereotype.

D.hispida or 'ubi gadong' is the wild tubers species that are known to be consumed by people. As shown in figure 2, the pH value of *D.hispida* increase in all types removal dioscorine equipment including wavy and spin types of water circulation on previous used of manual machine. Increasing pH activity of

D.hispida slices tuber increase with time of detoxified process. For instance, the pH activity of spin type water circulation increase at initial stages with 5.95 to 6.23 at 2 hours of detoxified process. And it slowly increases at 6.30 and 6.33 at 4 and 6 hour of detoxified process respectively. These indicate that extraction process of dioscorine occurred and it was removed from *D.hispida* slices tubers make it become low level of acidity.

From experiment of manual stand alone for dioscorine removal machine, the survival of *Cyprinus carpio* fish in *D.hispida* slices tuber is measured for indicating the toxic removal. Increasing of fish survival will increase with the times of detoxified process. The result can be considered as a positive if the fish can survive more than 6 hours after exposure to the solution. This can be used as an indicator because human digestion takes 4 hours after taken a meal. Fish survived with the time of the detoxified processes. The development of Muslim automatic washing machine will use the measurement values of light sensor or camera vision on determination of debris or contaminated removal efficiency and measuring with statistical analysis.

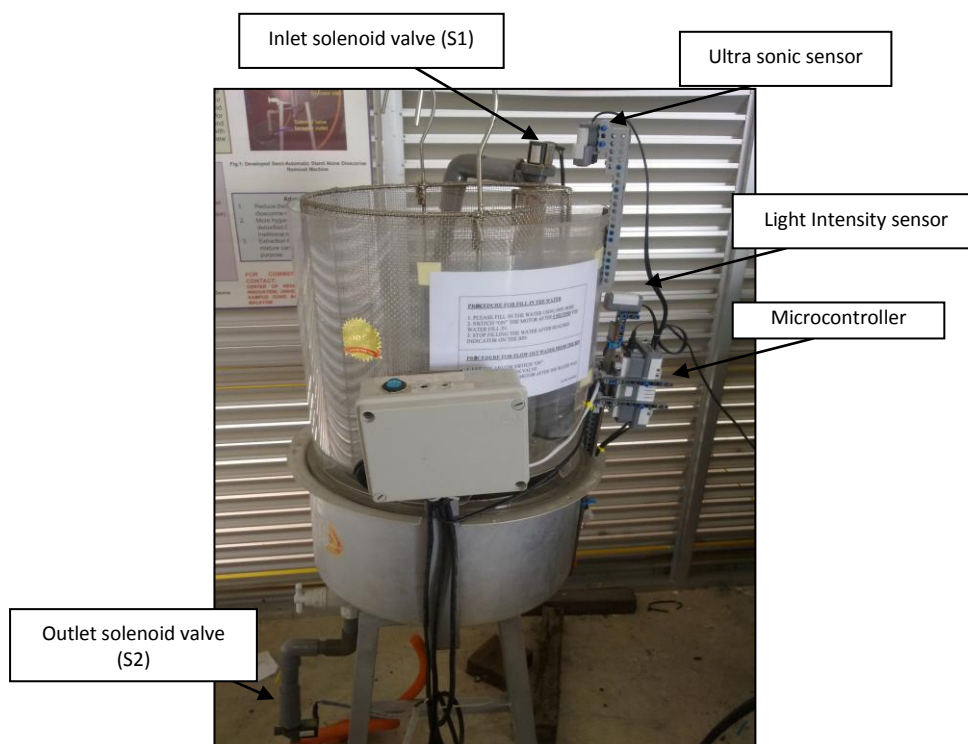


Fig. 1. Developed Automatic Stand alone dioscorine removal equipment.

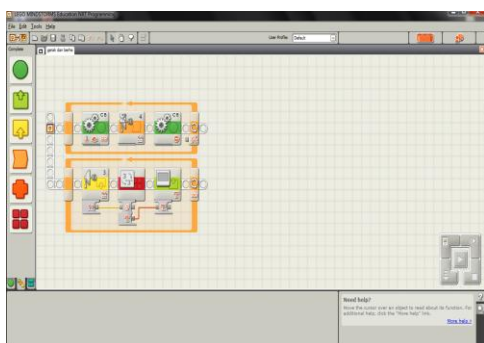


Fig. 2. show the graphical user interface software used for machine program.

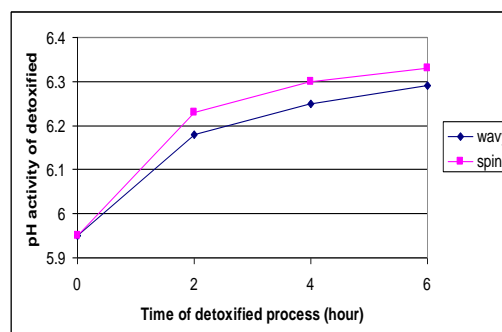


Fig. 3. show pH activity of slices tuber of *D.hispida* during detoxified process.

3.1. Processing Flow on Development Of Muslim Automatic Washing Machine

Figure 4 shows the algorithm flow for proposal on development of Muslim automatic machine. This proposal was submitted to Ministry of Higher Education, Malaysia on getting the research grant sponsorship where the priority of now day research is about the integration such different expertise (Norazmi et al., 2012).

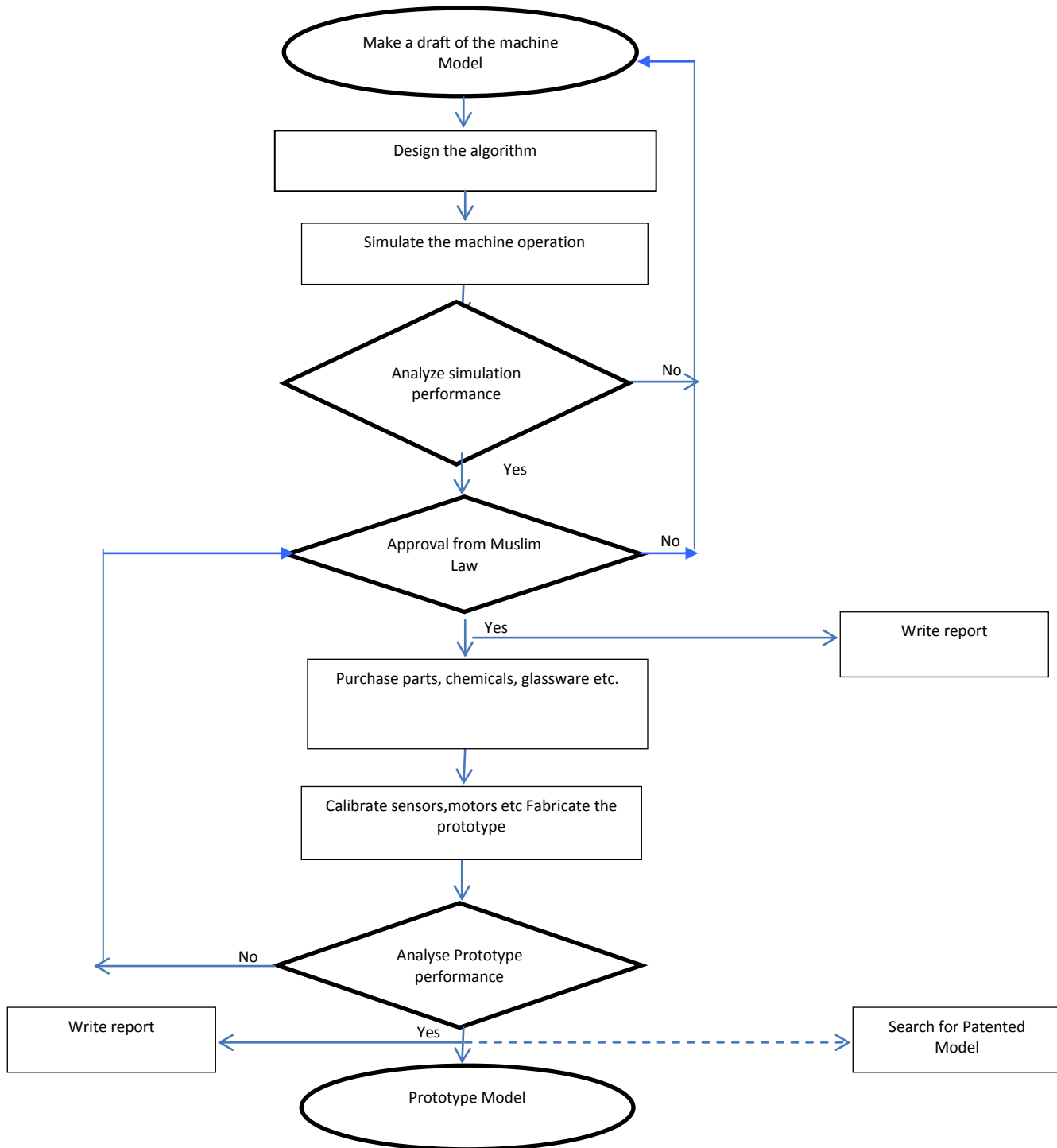


Fig. 4. Algorithm flow for proposal development of Muslim washing automatic machine.

4. Conclusions

The development of food product from *D.hispida* via this technology on stand alone machine and future work makes it safe to consume by people. Similarly this concept elaborates on conceptual automatic washing machine operation which complies with Islamic law of syarak. If this machine can make the toxin food of *D.hispida* consume safely, similarly inshaAllah this machine also can completely remove the excrement from contaminated cloth to fulfill Islamic purity for worship. Integration of algorithm system into the washing machine, the continuous running water will be subjected during the initial wash and spin option. The sensor application will ensure the contaminated solids or liquids will be accordingly removed while the solenoid valves is used to control the water tank level during washing and drying period. This machine is very important to develop but was not to argue on existing washing machine in market now days. It is only to make more convinced for Muslim user on fluid based excrement cleaning of praying cloth.

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References

- Agbor- Egbe, T., Treche, S., 1995. Evaluation of chemical composition of Cameroonian yam germplasm. J. Food Compos. Anal., 8, pp. 274-283.
- Abdullah, S.A., 1990. Poisonous Plants of Malaysia. 1st ed. Kuala Lumpur: Tropical Press Sdn. Bhd. pp. 19.
- Hahn, S.K., 1995. Yams:Dioscorea spp. (Dioscoreaceae). In: J. Smartt and N.W. Simmonds (Eds), Evolution of crop plants, pp:112-120. Longman Scientific and technical, UK.
- Nashriyah, M., Nornasuha, Y., Salmah, T., Norhayati, N., Rohaizad, M., 2010. "Dioscorea Hispida Dennst. (Dioscoreaceae): An Overview", Buletin UniSZA, No. 4, ISSN 2180-0235
- Tattiyakul, J., Naksriarporn, T., 2010. X-ray Diffraction Pattern and Functional Properties of Dioscorea hispida Dennst Starch Hydrothermally Modified at Different Temperatures. Journal of Food Bioprocess Technology, Online first, Doi: 10.1007/s11947-010-0424-3
- Udensi, E.A., Oselebe, H.O., Iweala, O.O., 2008. "The Investigation of Chemical Composition and Functional Properties of Water Yam (Dioscorea alata): Effect of Varietal Differences", Pakistan J. Nutr., 7(2), pp. 324-344.
- Ishak, W.I.W., Tan M.Y., Hudzari, R.M., 2011b. "Development of Control Program for Plant Growth Parameter Analysis in Lowland Tropical Greenhouse", J. Appl. Sci., 11(3), pp. 592-598.
- Razali, M.H., Wan-Ismael, W.I., Ramli, A.R., Sulaiman, M.N., 2008. "Modeling of Oil Palm Fruit Maturity for the Development of an Outdoor Vision System," Inter. J. Food Engin., 4(3), pp 1396-1396.
- Raymond, M., 2004. Flow of Industrial Fluids: Theory and Equations. CRC Press. ISBN 0849327679, pp. 43–44.
- Razali, M.H., Ismail, W.I.W., Ramli, A.R., Sulaiman, M.N., Harun, M.H., 2010. "Colour for Agriculture Product in Al-Quran", Proceeding of 2nd International Conference on Islamic Science and Technology", 20th-21th October 2010, Johor Bahru, Malaysia (ISBN 978-983-9805-98-7)
- Norazmi, A., Engku, A.Z., Engku, A., Haji Razali, M.H., 2012. "Integartion of Islamic education with Biotenology course in Higher Learning Institutions in Malaysia" (in Malay). World Conference on Islamic Thought 2012: Contemporary Challenges and Realities (WCIT2012), Ipoh, Perak, Malaysia, 11 - 12 September 2012.